

# An Apple a Day

## Objective

Students will read the history of apples and explore apple-related idioms. Students will read about Johnny Appleseed and answer comprehension questions. Students will conduct scientific experiments with apples. Students will classify apples and conduct mathematical activities with apples.

## Background

The apple is the fruit produced by the apple tree. The apple tree is classified as deciduous because it drops all its leaves in the colder months. This is called “defoliation.” Evergreen trees drop leaves annually, too, but they don’t lose all their leaves at once like deciduous trees.

Most apples are ripe for harvesting in the fall, although some cultivars ripen during mid summer through the fall. Because the apple tree develops blossoms that will turn into apples, the term used in the field of botany for the family of fruits that includes apples is “pome.” A pome is a type of fruit that is produced by a flowering plant.

The apple tree originated in Central Asia, where it has been grown for thousands of years. Apples first came to the US in 1625 from an apple planted in Boston.

As colonists moved west, they carried apple seeds with them. As a result, apples are grown in every state in the US. Twenty-nine states, including Oklahoma, grow apples commercially. In Oklahoma’s first agricultural censuses, apple was listed as a major crop, though that is no longer the case. Today most apples grown in Oklahoma are in small family orchards and gardens.

The apple tree has undergone many changes. Through the years, horticulturists have used a technique called “grafting” to improve the color, size, shape, flavor, store ability and cooking quality of the fruit. Grafting has also been used to improve production potential, tree growth habit, tree size and to help the tree adapt to certain environmental changes. Resistance to disease and pests is also a consideration. Grafting is when the tissues of one plant are connected with the tissues of another plant, resulting in one plant with both characteristics.

There are now more than 7,500 known cultivars, or varieties, of apples. This has resulted in a large range of unique and desirable characteristics in apples. Some are better for cooking, some for eating fresh and others for making cider. Apples are now the leading product of the United States fruit industry.

Apples are often called the “miracle fruit” because of the many vitamins and minerals they contain. Apples are very high in Vitamins C and B as well as containing fiber and minerals, such as calcium, potassium and phosphorus.

## Oklahoma Academic Standards

### PRE-KINDERGARTEN

Speaking and Listening: R.1,2,3; W.1,2. Reading and Writing Process. Critical Reading and Writing: R.2,4; W. Vocabulary: R.1,2,3; W.1,2  
Algebraic Reasoning: 1,2.  
Measurement: 2.1,2,3. Data & Probability: 1,2  
Creative Skills—1.4

### KINDERGARTEN

Speaking and Listening: R.1,2,3; W.1,2. Reading and Writing Process: R.1,3; W.1,2. Critical Reading and Writing: R.2,4; W. Vocabulary: R.1,2,3; W.1,2  
Earth Science: 3-1. Life Science: 1-1  
Number & Operations: 2.1; 3.1.  
Algebraic Reasoning: 1.1,2.  
Geometry & Measurement: 1.2; 2.1,2,3. Data & Probability: 1,2,3

### GRADE 1

Speaking and Listening: R.1,2,3; W.1,2. Reading and Writing Process: R.1,3; W.1,2. Critical Reading and Writing: R.2,3,4,5; W.1. Vocabulary: R.1,3,4,5; W.1,2  
Life Science: 1-1  
Number & Operations: 1.3; 2.1,2,3. Data & Probability: 1,2,3

### GRADE 2

Speaking and Listening: R.1,2,3; W.1,2. Reading and Writing Process: R.1,3; W.1,2. Critical Reading and Writing: R.2,3,4,5; W.1. Vocabulary: R.1,2,3; W.1,2  
Geography: 2,3  
Life Science: 2-2; 4-1  
Number & Operations: 2.1,2,5,6.  
Algebraic Reasoning: 2.2. Data & Probability: 2,4

## Materials

several different varieties of apples

aquarium or other transparent, enclosed container for observing

lemon juice a

shallow bowl

knife

water.

empty tuna cans or other shallow cans

modeling clay

6-8 inch twigs with branches

1-inch green tissue paper squares

red beads

construction paper strips to fit around cans

craft glue

## English Language Arts

1. Read and discuss background and vocabulary.
2. Students will work individually or in groups to name or write down as many words as they can that have something to do with or can be made using apples (e.g., pie, core, orchard, cider, jelly, seed).  
—Students will write sentences using two or more of the words in each one.
3. Write the words APPLE ORCHARD on the board.  
—Students will play a game to see who can come up with the largest number of words from the letters you have written on the board.  
—Words must be spelled correctly and contain at least two letters.  
—Each word is worth one point, with words related to apples worth two points (e.g., core).
4. Students will create simple poems using the word “apple” to start the first line. For example:  
Apples taste yummy  
Put into my tummy  
Perfectly green are a few  
Like grass with a morning dew  
Each day I start by eating one or two!
5. Print copies of the apple idioms and definitions included with this lesson, and cut them out, separating the idiom from its definition. You may need to print out more than one copy so there will be enough copies for the game.  
—Using two baskets (or similar) place the idioms in one basket and the definitions in another basket.  
—Separate the class in half, with one half on one side of the room and the other half on the other side of the room.  
—Half the class will draw idioms out of the Idiom Basket and the other half will draw out a definition.  
—Students will find “partners” by matching the idioms with the correct definitions.
6. Read the included story of Johnny Appleseed as a class.  
—Many of the stories of Johnny Appleseed are considered legends. Students will read the story on their own and circle the parts they think are legend and underline the parts they think are fact. Students will defend their choices.  
—Students will answer the comprehension questions included with this lesson.  
—Students will write narrative pieces, describing their travels, as if they were Johnny Appleseed. They should include people they met along the way and troubles they encountered. They should describe the landscape and the apple planting and the work they do to protect the new apple trees (such as building fences out of branches to keep animals away). Students will

read their descriptions aloud to the class and allow peers to ask questions related to details of the story.

## Social Studies

1. On the map of the US included with this lesson, students will find Massachusetts, the starting point of Johnny Appleseed's adventures—Students will draw an apple there, then continue drawing apples to trace the adventures described in the passage (Massachusetts to Pennsylvania to Ohio to Indiana.)
2. Students will use a topographic map of the US to identify land formations that would have been difficult for Johnny to get through by foot.

## Science

1. Assemble the following materials for students to dress as different parts of a tree:
  - Crown and Leaves—Umbrella with paper leaves attached
  - Trunk—Small piece of wood with a long string attached to wear as a necklace and vest made from paper grocery bag decorated with squiggly lines to resemble bark.
  - Roots—Rope tied together at different lengths with knots placed at student's feet.
  - Flower—paper or plastic flowers attached to a headband
  - Fruits—fruit shapes cut out of construction paper and hung on loops of string to hang over students outstretched arms
  - Seeds—gloves with paper cut outs of seeds attached to each finger

—Divide students into groups to represent the parts of a tree.  
—Group members will use the materials described above to dress like the tree parts.
2. Read *The Giving Tree*, by Shel Silverstein. Students will brainstorm to list all that we get from trees. (food, shelter, clothing, etc.) Write the list on the board.  
—Students will match items to the different parts of the tree.
3. Students will design an experiment to test the idiom “One bad apple spoils the whole barrel.”  
—Provide fresh apples with one that is not so fresh.  
—Students will observe the apples every day and write their observations.  
—Keep the apples in an enclosed aquarium or other enclosure to avoid fruit flies.
4. Obtain several different varieties of apples and cut them into pieces for students to sample.  
—Students will make simple charts to record their observations about each type of apple (sweet, tart, crunchy, etc.).  
—Students will develop a classroom graph to reflect observations of each apple type by the class.  
—Students will describe their favorite type of apple in a short paragraph

## Vocabulary

**annually**—occurring once a year  
**botany**— a branch of biology dealing with plant life  
**census**— a gathering of information done by a government every so often  
**commercially**—designed mainly for profit  
**cultivar**— an agricultural or horticultural variety or strain  
**deciduous**— falling off (as at the end of a growing period or stage of development)  
**defoliation**—depriving of leaves  
**evergreen**— having leaves that remain green and functional through more than one growing season  
**pome**—a fleshy fruit consisting of an outer thickened fleshy layer and a central core with usually five seeds enclosed in a capsule  
**grafting**—to join or unite one part of a plant with another  
**harvest**— the gathering of a crop  
**horticulture**—the science and art of growing fruits, vegetables, flowers, or ornamental plants  
**orchard**— a place where fruit or nut trees are grown  
**nursery**—a place where plants, trees and shrubs are grown for the purpose of grafting or for sale  
**ripe**— fully grown and developed  
**sow**—to plant seed for growth

## Another Apple Legend: Sir Isaac Newton

Legend has it that in 1666, a young Isaac Newton was sitting in his mother's orchard in Lincolnshire, a county on the eastern shore of England, when an apple fell from a tree. Isaac began to wonder why the apple fell downward rather than upward or sideways. Through this observation, Isaac Newton is said to have developed the theory of universal gravitation.

## Apple Cinnamon Dough Ornaments

(Makes enough for 15-20 children)

4 cups ground cinnamon  
3 cups applesauce  
1/2 cup white school glue

1. Add cinnamon to applesauce, stir.
2. Add school glue.
3. Once the dough resembles cookie dough, distribute to students.
4. Students will roll the dough and cut with cookie cutters or cut shapes using wooden craft sticks.
5. Punch holes in the ornaments with a straw or pencil.
6. Place dough in a warm, dry spot to dry. The complete drying process may take a few days.
7. String yarn through the holes when they are dry.

and explain why it is their favorite.

5. Explain to students that when an apple is sliced and exposed to air, chemicals within it combine with oxygen and make the apple turn brown.
  - Students will hypothesize why the inside of an apple turns brown after it is cut open.
  - Students will write and share their hypotheses.
  - Conduct the following demonstration.
    - Slice an apple into four pieces.
    - Place one slice in a bowl of shallow water, just enough water to completely cover the slice of apple.
    - Coat a second slice with lemon juice.
    - Place a third slice in a salt water solution.
    - Leave the fourth slice in the open, unaltered.
  - Students will carefully examine each of the three apples and record their observations.
  - Students will discuss their observations as a class or in small groups.
  - Students will develop a simple graph to show how each variable, (water, lemon juice, and air) affected the apples.

*Explain: The apple that is submerged in water will not turn brown immediately; the water covers it and keeps it safe from the effects of the oxygen in the air. The lemon juice inhibits catalase activity. Catalase is an enzyme that causes browning. The lemon-juiced slice should stay white even longer than the one underwater. Salt water solution also inhibits catalase activity, so the slice placed in salt water should stay white as well. The fourth slice of apple is the one most exposed to the air and will turn brown much more quickly than the first two.*

## Math

1. Bring 3 or 4 different varieties of apples of various colors and sizes variations (enough so students can wash and eat them at the end of the activity).
  - Students will order the apples in groups according to size, from largest to smallest.
  - Students will separate the apples according to color variation, shape, size, etc.
  - Students will write number sentence to show addition and subtraction of the groups of apples.
  - Students will place the apples in pattern formations, such as red, red, green, red, red, green.
2. Bring several different varieties of apples and cut them into pieces so that each student gets a small piece of each variety.
  - Students will design their own charts for judging the varieties of apples on a scale of 1-5, based on qualities such as sweetness, crunchiness, color, and other qualities students would like to include
  - Students will taste the apples and rank them on their charts.
  - Students will collaborate in groups to chart their finding with a bar graph or line graph.

## Ag Career: Quality Control Manager

A quality control manager for a fruit orchard makes sure production runs smoothly and generates a consistently suitable output. He/she makes sure the product meets acceptable quality standards set forth by the Food and Drug Administration and looks for way to improve the manufacturing process. This position requires a bachelor's degree in an industrial or scientific program of study, such as engineering or business administration, as well as work experience in manufacturing and production. Experience with an employer's specific industry may be required as well. It is vital that someone in this career field be able to communicate well with people as well as coordinate communication among different groups of people.

Source: Education Portal at [http://education-portal.com/articles/Quality\\_Control\\_Manager\\_Salary\\_Duties\\_and\\_Requirements.html](http://education-portal.com/articles/Quality_Control_Manager_Salary_Duties_and_Requirements.html)

## Visual Art

1. Students will make apple trees, as follows.
  - Write your name on the bottom of the tuna can.
  - Place dough or clay in the bottom of the tuna can. Stand a twig in the center of the can down into the clay.
  - Twist the green tissue paper so that it resembles a bow tie. Glue a few pieces of the tissue paper to the branches to look like leaves.
  - Glue red bead “apples” to the branches.
  - Decorate a construction paper strip, then glue it around the can.
  - Put your trees in a group in the classroom to form an “apple orchard.”

## Agriculture in Motion: Balance the Apple Relay Race

1. Take students outside or create space in the classroom or hallway.
  - Divide students into relay teams, and place two starting lines across from each other. Half of the team stands on one line and the other half stands on the other line.
  - Each student must start with an apple balanced on his/her head and begin moving toward teammates on the other side.
  - If the apple falls off, the student must begin again from where it fell off. When the student reaches teammates, he/she hands off the apple, and the next teammate takes a turn.
  - For younger children: Take turns with the apple on the student's head, standing in place and seeing who can keep it on his/her head the longest. The student balances on one foot to see which student can keep his/her balance the longest. See who can balance the apple the longest on an object such as a large spoon or a book.

## Extra Reading

Driscoll, Laura, *Apples and How They Grow*, Grosset & Dunlap, 2003.

McClure, Nikki, *Apple*, Abrams Appleseed, 2012.

Silverstein, Shel, *The Giving Tree*, Harper and Row, 2014.

Wellington, Monica, *Apple Farmer Annie*, Dutton, 2001.

Name \_\_\_\_\_

# Apple Idioms

## IDIOM

An apple a day keeps the doctor away.

One bad apple spoils the bunch.

the apple of my eye

as American as apple pie

The apple doesn't fall far from the tree.

in apple-pie order

sure as God made little green apples

apple polisher

apples and oranges

How do you like them apples?

upset the apple cart

## DEFINITION

Apples are so nutritious that if you eat an apple every day, you will not ever need to go to a doctor.

A bad person can spoil everything around it, just as a rotten apple can cause the apples around it to rot.

The pupil, or central point, of the eye. It refers to the favorite object of a person's love or affection.

Having qualities that are thought to be typical of the US or of the people of the US

Kids are like their parents.

In very good order; very well organized

a very sure thing

a flatterer

two things that are not at all similar

How do you like that?

Mess something up

# Johnny Appleseed

One of America's fondest legends is that of Johnny Appleseed, a folk hero and pioneer apple farmer in the 1800s. There really was a Johnny Appleseed, and his real name was John Chapman. He was born in Leominster, Massachusetts, in 1774. His dream was to produce so many apples that no one would ever go hungry. Although legend paints a picture of Johnny as a dreamy wanderer, planting apple seeds throughout the countryside, research reveals him to have been a careful, organized businessman who, over a period of nearly 50 years, bought and sold tracts of land and developed thousands of productive apple trees.

His adventures began in 1792, when John was eighteen years old. He and his eleven-year-old brother, Nathaniel, headed west, following the steady stream of immigrants. In his early twenties, John began traveling alone. That is how he spent the rest of his life. Nathaniel stayed behind to farm with their father, who had also migrated west. John continued moving west to Pennsylvania. From there he traveled into the Ohio Valley country and later, Indiana. He kept ahead of the settlements and each year planted apple seeds farther west.

He always carried a leather bag filled with apple seeds he collected for free from cider mills. Legend says he was constantly planting them in open places in the forests, along the roadways and by the streams. However, research suggests he created numerous nurseries by carefully selecting the perfect planting spot, fencing it in with fallen trees and logs, bushes and vines, sowing the seeds and returning at regular intervals to repair the fence, tend the ground and sell the trees. He soon was known as the "apple seed man," and later he became known only as "Johnny Appleseed."

He was described as a man of medium height, with blue eyes, light-brown hair, slender, wiry and alert. Folklore has also described him as "funny looking" because of the way he dressed. It is said he traded apple trees for settlers' cast-off clothing. He gave the better clothing to people he felt needed it more than he. This could be why legend says he wore only coffee sacks with holes cut out for his arms as clothing. He rarely wore shoes, even during the cold of winter. It is said he could walk over the ice and snow barefooted, and that the skin was so thick on his feet that even a rattlesnake couldn't bite through it. Another legend says he wore a mush pot on his head as a hat. He rarely sought shelter in a house, since he preferred to sleep on bare ground in the open forest with his feet to a small fire.

In the passage above, underline the parts that sound like legend and circle the parts that sound like fact.

What is the main idea of the first paragraph?

How old was Johnny when he started his adventures? (He was 18 years old.)

Name \_\_\_\_\_

# Johnny Appleseed

## COMPREHENSION QUESTIONS

Read the passage about Johnny Appleseed included with this lesson and answer the following questions about the passage:

1. What is the main idea of the first paragraph?
2. How old was Johnny when he started his adventures?
3. In Paragraph Three we learn that Johnny created nurseries where he planted seeds, then fenced them in using fallen trees and logs. Why do you think Johnny needed to fence in his apple trees?
4. Eventually, John Chapman became known as Johnny Appleseed. What else was he known as for a short time?
5. What is the purpose of the last paragraph?
6. What are some character traits you would use to describe Johnny Appleseed?
7. What is your favorite part of the story about Johnny Appleseed?
8. Underline the parts that sound like legend and circle the parts that sound like fact.

Oklahoma Ag in the Classroom is a program of the Oklahoma Cooperative Extension Service, the Oklahoma Department of Agriculture, Food and Forestry and the Oklahoma State Department of Education.

Name \_\_\_\_\_

# Johnny Appleseed (answers)

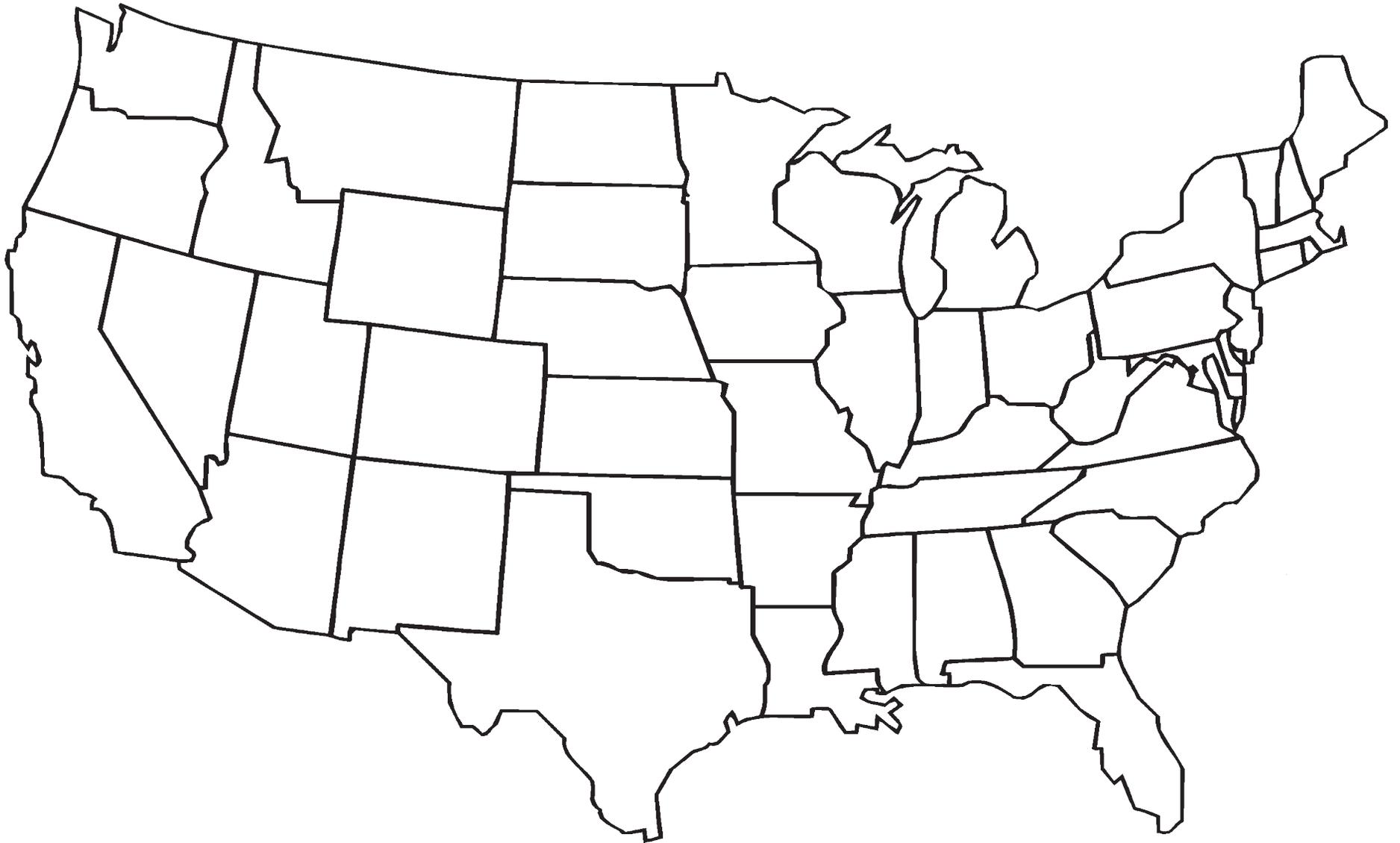
## COMPREHENSION QUESTIONS

Read the passage about Johnny Appleseed included with this lesson and answer the following questions about the passage:

1. What is the main idea of the first paragraph?  
It introduces and describes Johnny Appleseed.
2. How old was Johnny when he started his adventures?  
He was 18 years old.)
3. In Paragraph Three we learn that Johnny created nurseries where he planted seeds, then fenced them in using fallen trees and logs. Why do you think Johnny needed to fence in his apple trees?  
Possible answer: He wanted to keep the wild animals from eating the apples.
4. Eventually, John Chapman became known as Johnny Appleseed. What else was he known as for a short time?  
He was also known as “apple seed man.”
5. What is the purpose of the last paragraph?  
It describes Johnny’s character traits.
6. What are some character traits you would use to describe Johnny Appleseed?
7. What is your favorite part of the story about Johnny Appleseed?
8. Underline the parts that sound like legend and circle the parts that sound like fact.

Name \_\_\_\_\_

# US Map



Oklahoma Ag in the Classroom is a program of the Oklahoma Cooperative Extension Service, the Oklahoma Department of Agriculture, Food and Forestry and the Oklahoma State Department of Education.